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1 **WHAT IS CLAIMED IS:**

2   1.   A method for verifying the design of a disk controller circuit to be incorporated

3 into a targeted hard disk drive system, wherein the targeted hard disk drive system comprises a

4 read/write channel and a head actuator, the method comprising the steps of:

5   emulating reading and writing of data in the read/write channel based upon a model of the

6 read/write channel;

7   emulating a behavior of the head actuator during track seek and track following

8 operations based upon an electromechanical model of the head actuator;

9   providing a disk controller design base for defining integrated circuit elements

10 comprising the disk controller circuit;

11   providing a controller environment to support execution and debug of firmware for

12 operating the disk controller circuit;

13   performing a plurality of disk functions according to a script, wherein the plurality of disk

14 functions comprise interaction of the read/write channel model, the electromechanical model, the

15 disk controller design base and the controller environment.

1   2.   The method of claim 1, wherein the plurality of disk functions are performed at a

2 time-scaled rate, wherein the time-scaled rate maintains an accurate relative time relationship

3 between the plurality of disk functions performed under direction of the script, and a real-time

4 performance of the disk functions.

1   3.   The method of claim 1, wherein the plurality of disk functions are performed at a

2 plurality of environmental limits, wherein the models and the design base are made to operate

3 according to their predicted behavior at the environmental limits.

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